REMARKS/ARGUMENTS

Reconsideration of the application as amended is respectfully requested.

Status of Claims

Claims 1-3 and 5-7 are pending in the application, with claim 1 and 6 being the only independent claims. Claim 1 has been amended.

Overview of the Office Action

In the Office Action dated February 14, 2006, the Examiner rejected claims 1, 2 and 5-7 under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,686,985 (*Tanaka*) in view of U.S. Patent No. 4,937,129 (*Yamazaki*). In addition, the Examiner rejected claim 3 under 35 U.S.C. §103(a) as unpatentable over *Tanaka* in view of *Yamazaki* and further in view of U.S. Patent No. 5,157,470 (*Matsuzaki*).

In the Advisory Action dated June 1, 2006, the Examiner maintained the above-discussed 35 U.S.C. §103(a) rejections.

Arguments

Independent Claim 1

Applicants respectfully submit that amended claim 1 is patentable over *Tanaka* in view of *Yamazaki* and/or *Matsuzaki* because

(A) the combination of *Tanaka* and *Yamazaki* fails to teach or suggest all of the limitations of claim 1;

(B) there is no suggestion or motivation to combine *Tanaka* with *Yamazaki* and *Matsuzaki* in the way proposed in the Office Action/Advisory Action; and

(C) using a foundation film having a thickness in the range of greater than 0 to 8 nm produces unexpected results.

(A) The Combination of Tanaka and Yamazaki Fails to Teach or Suggest All of the Limitations of Claim 1

Referring now to Fig. 4, *Tanaka* teaches using the insulator film (201) to prevent the first metal film (222) from being removed from the device substrate (200) by heat treatment and to prevent impurities in the substrate (200) from diffusing in the first metal film (222). *See* Fig. 4; and col. 7, lines 24-29 of *Tanaka*.

Tanaka also teaches that if such adhesion problems or impurity contamination problems do not occur, the insulator film (201) can be omitted. *See* col. 7, lines 24-29 of *Tanaka*. In item 4 of the Advisory Action, the Examiner refers to this teaching, and contends that

> "it also means that if there are less impurities diffusing into the metal film, then the thickness of the insulator film of Tanaka can be reduced. Therefore, it would have indeed been obvious to one of ordinary skill in the art at the time the invention was made, to have used silicon oxide to form the foundation film of Tanaka, and to have formed it with a thickness within the range of greater than 0 to 8 nm, in order to block ion impurities from diffusing from the glass substrate of Tanaka into the metal film of Tanaka, as taught by Yamazaki."

The Examiner's conclusion, however, is incorrect.

Tanaka does not discuss or specify the thickness of the insulator film (201), nor does *Tanaka* discuss or specify the parameters of such adhesion and impurity contamination problems. *Tanaka* certainly does not teach or suggest that the insulator film (201) has a thickness in the range of greater than 0 to 8 nm when both the thickness of the insulator film (201) and the parameters of the impurity contamination problems are not even discussed or specified. Rather, *Tanaka* merely discloses two options—using the insulator film (201) if there are adhesion and/or impurity contamination problems, or not using the insulator film (201) if there are no adhesion and/or impurity contamination problems.

Furthermore, as explained in detail in the Response dated May 15, 2006, *Yamazaki* specifically teaches that when only one ion blocking film is used, that ion blocking film must have a thickness of at least 10 nm in order to effectively block sodium ion contamination from the glass substrate (1). *Yamazaki* actually teaches a thickness in the range of 10-150 nm.

Therefore, the combination of *Tanaka* and *Yamazaki* would result in the insulator film (201) of *Tanaka* having a thickness of at least 10 nm, not in a range of greater than 0 to 8 nm, as recited in claim 1 of the present application.

The idea that the insulator film (201) of *Tanaka* has a thickness in the range of greater than 0 to 8 nm comes only from the teaching and disclosure of the present application because, as discussed above, *Tanaka* does not teach or suggest such a thickness range and *Yamazaki* teaches a thickness of at least 10 nm.

(B) No Suggestion or Motivation to Combine Tanaka with Yamazaki and Matsuzaki in the Way Proposed in the Office Action/Advisory Action

Referring now to Figs. 2A and 2B, *Matsuzaki* discloses a thin film transistor, in which the thin silicon oxide film (10) is used to prevent the aluminum electrodes (5, 6) from reacting with the amorphous silicon in the thin silicon film pattern (4). *See* Figs. 2A and 2B; col. 2, lines 58-60; col. 6, lines 26-37; and col. 7, lines 46-54 of *Matsuzaki*.

In item 8 of the Advisory Action, the Examiner refers to *Matsuzaki*, and contends it

> "demonstrat[es] that the claimed thickness range of greater than 0 to 8 nm is indeed an obvious variation for a silicon oxide film protecting an aluminum film from contamination, to suit the level of possible contamination to the aluminum film in the laminate of Tanaka."

However, since the insulator film (201) of *Tanaka* is used to prevent the first metal film (222) from being removed from the device substrate (200) by heat treatment and to prevent impurities in the substrate (200) from diffusing in the first metal film (222), and since the thin

silicon oxide film (10) of *Matsuzaki* is used to prevent the aluminum electrodes (5, 6) from reacting with the amorphous silicon in the thin silicon film pattern (4), a person with ordinary skill in the art would not be motivated to specify the thickness of the insulator film (201) of *Tanaka* to be in the range of greater than 0 to 8 nm. After all, the adhesion and impurity contamination problems being solved by *Tanaka* are different from the electrode/amorphous silicon reaction problem being solved by *Matsuzaki*. In addition, the Examiner offers no evidence to prove that the silicon oxide film (10) of *Matsuzaki*, which has the thickness range of 0.5-10 nm, can be used to satisfactorily address both the adhesion problems and the impurity contamination problems being solved by *Tanaka*.

(C) Unexpected Results

The embodiment of the present claimed invention uses a foundation film (3) with a thickness range of greater than 0 to 8 nm to improve the crystal structure of the Al metal in the semi-transmitting reflective film (4) formed on the foundation film (3) so that an increase in the amount of optical absorption of the Al metal can be prevented. As a result, both the optical transmission performance and the reflection performance of the semi-transmitting reflective film (4) or the semi-transmitting mirror (6) can be improved. However, if the thickness of the foundation film (3) exceeds 8 nm, the reflectivity will drop and the amount of the optical absorption of the Al metal itself will increase. *See* Figs; 3-6; and Table 1 and paragraphs [0028] and [0041] of the published specification. Thus, using a foundation film with a thickness range of greater than 0 to 8 nm produces unexpected results relative to the thickness range of 10-150 nm resulting from the combination of *Tanaka* and *Yamazaki*.

In view of the arguments (A), (B) and (C) presented above and the addition of the liquid crystal layer limitation to claim 1, withdrawal of the §103(a) rejection of claim 1 is respectfully requested.

Independent Claim 6

Independent claim 6 is patentable over *Tanaka* in view of *Yamazaki* or *Matsuzaki* for reasons discussed above in connection with claim 1.

In addition, the same reasons why there is no suggestion or motivation to modify *Tanaka* with *Matsuzaki* (as discussed above, the problems being solved by *Tanaka* and *Matsuzaki* are different) with respect to the foundation film thickness limitation are also applicable to the limitation that the foundation film has a chemical composition ratio x of oxygen (O) to silicon (Si) in the silicon oxide (SiO_x) in a range of 1.5 to 2.0.

In view of the foregoing, withdrawal of the §103(a) rejection of claim 6 is respectfully requested.

Dependent Claims 2, 3, 5 and 7

Claims 2, 3, 5 and 7 depend, either directly or indirectly, from claim 1 or claim 7, and, thus, each is allowable therewith.

In addition, claims 2, 3, 5 and 7 include features which serve to even more clearly distinguish the claimed invention over the prior art of record.

Conclusion

Based on all of the above, it is respectfully submitted that the present application is now in proper condition for allowance. Prompt and favorable action to this effect and early passing of this application to issue are respectfully solicited.

Should the Examiner have any comments, questions, suggestions or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

Any additional fees or charges required at this time in connection with the application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

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July 14, 2006